GR 97 P 1861 D

BOX AF

CERTIFICATION OF FACSIMILE TRANSMISSION

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By: Nathan Wolff Date: SEPT. 26, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Volker Weinrich et al.

Applic. No. : 09/645,807

Filed : August 24, 2000

Title : Method of Producing an Electrode Configuration and Method of Electrically Contacting the Electrode Configuration

Examiner : Shamim Ahmed

Group Art Unit : 1765

R E S P O N S E under 37 C.F.R. § 1.116

Hon. Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

S i r :

Responsive to the final Office action dated July 25, 2003, the following remarks are made:

Reconsideration and allowance of claims 1-14 and 21-22 are solicited.

Claims 1-14 and 21-22 remain in the application.

In item 3 on page 2 of the above-identified Office action, claims 1-3, 7-9, 12-14, and 21-22 have been rejected as being anticipated by *Summerfelt et al.* (US 5,619,393) under 35 U.S.C. § 102.

In item 5 on page 3 of the Office action, claims 4-6 have been rejected as being obvious over *Summerfelt et al.* in view of *Chung* (US 5,976,394) under 35 U.S.C. § 103.

In item 6 on page 4 of the Office action, claims 10-11 have been rejected as being obvious over *Summerfelt et al.* in view of *Yang et al.* (US 5,436,190) under 35 U.S.C. § 103.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and the claims have, therefore, not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

> A method of producing an electrode configuration, which comprises the following steps:

forming a first conductive layer of a material which is substantially unetchable by chemical dry-etching;

forming a second conductive layer on the first conductive layer from a material which is etchable by chemical dry-etching;

structuring the second conductive layer to form a structured second layer; and

chemical-physical dry etching the first conductive layer while ***using the second structured layer as a mask***.

On pages 2 and 3 of the Office action, the Examiner stated that:

> Summerfelt et al disclose an electrode configuration in a stacked capacitor, in which a second conductive layer (42) of titanium nitride is formed on a first conductive layer (40) of platinum (col.6, tines 41-62).
>
> Summerfelt et at inherently teach that the first conductive layer is unetchable to chemical dry etching because the material for the first conductive layer is similar as the instant application (see lines 18-21 at page 15 of the instant application).
>
> Summerfelt et al further teach that the second and the first conductive layers are structured, wherein the first conductive layer such as platinum is etched using the second conductive layer as a mask (see figures 9-10) and also teach that, the etching of platinum layer is primarily done by physical dry etching or reactive ion etching (col.6, lines 10-49).

The "second conductive layer 42" is mentioned in *Summerfelt et al*. at:

Col. 6, lines 48-50:

FIG. 7 illustrates an ***upper electrode*** of TiN 42 deposited on upper Pt film 40.

Col. 6, lines 57-62:

FIG. 9 illustrates the structure of FIG. 8, with an upper thin unreactive film of Pt 40 deposited on BST layer 38, and an ***upper electrode*** of TiN 42 deposited on upper Pt film 40. Pt layer 40 provides a stable conductive interface between BST layer 38 and TiN layer 42.

Col. 7, lines 11-14:

The two other TiN plugs 48 make electrical contact from the aluminum top metallization layer 50 to the TiN ***upper electrode*** 42 and to the doped silicon region 44.

Col. 7, lines 17-22:

The basic capacitor structure of FIG. 9 is used however in this embodiment the lower Pt layer 36, BST layer 38, upper Pt layer 40 and TiN layer 42 are deposited such that they form sidewalls and thus increase the total surface area of the ***electrodes*** in contact with the BST 38.

Table in col. 10:

42 Titanium nitride ***Upper electrode*** Other conductive metal compounds ...

Clearly, in the written disclosure of *Summerfelt et al.* the "second conductive layer 42" is mentioned only in the context of an upper electrode. There is no disclose or suggestion in *Summerfelt et al.* of using the "second conductive layer 42" as a mask, or as a mask for etching the "first conductive layer 40".

Figs. 9 and 10 of *Summerfelt et al.*, cited by the Examiner and re-produced below, do not show - at least expressly or implicitly - that the "second conductive layer 42" is used as a mask, as compared of being used as an upper electrode as stated in the written specification of *Summerfelt et al.*.

FIG. 9

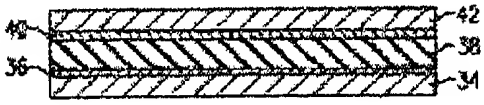
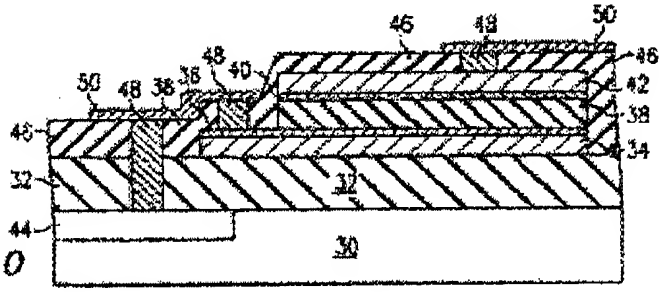


FIG. 10



As discussed in MPEP § 2112, a limitation recited in a claim that is not expressly or implicitly disclosed in a prior art reference is inherently disclosed therein if, and only if, the "missing" limitation is *necessarily* present in the prior art, and that it would be so recognized by persons of ordinary skill. The principles of inherency require that the inherency be absolute, and not probabilistic. As far as Applicants was able to ascertain, there is no disclosure or suggestion in *Summerfelt et al.* that it is ***absolutely necessary*** that the "second structured layer 42" is used as a mask.

Consequently, it is believed that *Summerfelt et al.* do not show etching the "first conductive layer 40" while ***using the "second structured layer 42" as a mask***, as recited in claim 1 of the instant application. Therefore, the invention as recited in claim 1 of the instant application is believed not to be anticipated by *Summerfelt et al.*.

It is accordingly believed to be clear that *Summerfelt et al.* do not show the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and because claims 2-14 and 21-22 are ultimately dependent on claim 1, they are believed to be patentable as well.

Considering the deficiencies of the primary reference *Summerfelt et al.*, it is believed not to be necessary at this stage to address the secondary references *Chung* and *Yang et al.* applied in the rejection of certain dependent claims, and whether or not there is sufficient suggestion or motivation with a reasonable expectation of success for modifying or combining the references as required by MPEP § 2143.

In view of the foregoing, reconsideration and allowance of claims 1-14 and 21-22 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, the Examiner is respectfully requested to telephone Counsel so that, if possible, patentable language can be worked out.

If an extension of time is required, petition for extension is herewith made.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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